Fatigue strength—$10^6$ cycles (0–690 MPa cyclical test)

Ultimate tensile strength—1150 MPa

Referring now to FIG. **2** of the drawing, similar parts to the example disclosed above in relation to FIG. **1** are accorded the same reference numerals. In this example, the internal bore **12** of gear body **10** as illustrated in FIG. **2** has a diameter d which is less than the final internal diameter D of the finished gear by an amount corresponding to twice the intended root-to-tip height h of the teeth in the finished gear. However, an annular recess **26** is cut into the internal bore **11** of the body **10** so as to extend axially from one end of the latter for about one-third of the length of the body. Collapsible wall **16** is welded at **18** to the internal bore **11** so as to close the inner periphery of annular recess **26** whereby open-topped annular chamber **14** is defined, into which latter Stellite **6** in a finely divided form is packed. In this embodiment, the annular wall is a simple sleeve having no tooth form thereon. The top of chamber **14** is then closed by annular plate **22** welded to the end of the body **10** and to the wall **16**, followed by evacuation of the chamber **14** through vent pipe **28** which is then securely sealed.

The whole assembly is then hot isostatically pressed. Following hot isostatic pressing the wall **16** and plate **22** are machined away, the internal bore **12** is machined to final diameter D and the required tooth form is machined in the hot isostatically pressed Stellite **6** powder.

We claim:

**1**. A gear comprising a body and gear teeth, said gear teeth being formed of a cobalt-based alloy which has been hot isostatically pressed from a powder for providing high fatigue strength and high corrosion resistance, said cobalt alloy consisting essentially of 10–35 wt % chromium, 0–22 wt % nickel, 0–20 wt % tungsten, 0–20 wt % iron, 0–10 wt % vanadium, 0–10 wt % molybdenum, 0–6 wt % niobium, 0–3 wt % silicon, 0–3 wt % carbon, 0–3 wt % boron, 0–1 wt % manganese, the balance, apart from impurities, being cobalt.

**2**. The gear as claimed in claim **1**, wherein said cobalt-based alloy consists of 26 wt % chromium, 5 wt % tungsten, 1 wt % carbon and 6 wt % niobium, the balance apart from impurities, being cobalt.

**3**. The gear as claimed in claim **1**, wherein said cobalt-based alloy consists of 29 wt % chromium, 9 wt % tungsten and 1.8 wt % carbon, the balance, apart from impurities, being cobalt.

**4**. The gear as claimed in claim **1**, wherein said body is one which has been formed integrally with said gear teeth out of the same alloy in the same hot isostatic pressing operation.

**5**. The gear as claimed in claim **1**, wherein said body is formed of precipitation-hardened stainless steel and said teeth are formed of the specified cobalt-based alloy, said teeth being joined to said body by means of a diffusion bond.

**6**. The gear as claimed in claim **1**, wherein the particle size of said powder subjected to hot isostatic pressing is such that it passes through a 150 μm sieve.

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